

Designing E-learning in Virtual Worlds for Apprenticeship Students in Canada

Martha Burkle

SAIT Polytechnic/ CISCO Chair in e-Learning, Calgary, Canada

Abstract— This paper presents the ongoing research on the challenges and opportunities of delivering course content to apprentices in the area of Avionics, Mechanics, and Electric engineering. Due to the current working situation, apprentices are going back to academia in order to update their skills and, for higher education institutions around the world, this represents an opportunity to connect content to the workplace context. However, the connection between learning and work should be done in the context of an engaging environment, where learners can interact with other learners in a rich virtual environment.

In order to analyze apprenticeship students' familiarity with IT and use of technologies for learning, close to 1,000 online surveys were distributed. Research findings are presented with a comparison of what the literature states regarding the new generation of learners (the Net Gen) and their use of technologies and the behavior (learning preferences, learning styles, use of IT) presented by the research sample. Innovative opportunities for learning at the workplace (such as future areas of research are suggested in the context of online and blended learning for the workplace.

Index Terms— Online learning, Apprentices, e-readiness, digital divide.

I. INTRODUCTION

In the context of the current economy, potential learners are coming back to educational institutions to update their skills. This is truth particularly in the case of Apprentices students who need to have access to content without leaving their workplaces.

It is with this need in mind that, working with Advance Education and Technology and the office of Apprentices and Industry in Canada, SAIT Polytechnic, a postsecondary institution in Calgary, has started to redesign some of its courses in the Welding and Electrician Programs, to offer students the possibility of online learning.

Table I presents a comparison of the growing number of Apprentices in Canada going back to continue their training. This, together with the fact that apprentices are now expecting content to be mobile, has encouraged higher education (postsecondary) institutions in the country, to provide different ways of accessing content.

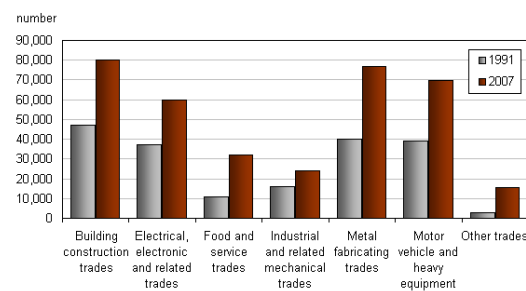


Table I

Registered apprenticeship registrations, by major trade group, 1991 and 2007 (Source: Statistics Canada, 2010).

II. A STUDENT CENTERED CURRICULA

One of the main concerns of the project has been the fact that apprentices have their own learning styles and preferences that most of the time differed to full time university students. Based on data obtained from SAIT Learning services, the project team soon learned that Apprentices are considered visual learners, preferring a hands-on training over a theoretical approach to curricula [1].

Another crucial element when considering a student centered online curricula was Apprentices' computer skills and Internet connectivity. SAIT previous experience in teaching apprentices students was challenged when considering students' access to the Web and experience with Learning Management Systems (LMS). In order to access content online, apprentices will need a basic training on LMS use, and Internet connections should be either provided or guaranteed.

With this challenge in mind, a 40 questions survey was designed and applied to students' candidates for the project. At the time of the writing, a total of 668 surveys (both printed and online) have been distributed among apprentices (in the Aeronautics, Welding, Plumbing, Electrician and Automotive Programs). The next session describes the survey in detail and presents the challenge of instructing the so called "Net Generation".

III. THE E-READINESS SURVEY

Research instruments were developed to find in-depth information regarding the use of technologies by students apprentices. A survey was design and applied among students in several apprentices programs.

a. Survey design

Following the ECAR Report as an example [2], an online and printed survey was designed in order to obtain first hand data on students' e-readiness. Questions were phrased in the areas of:

- a. Ownership of electronic devices
- b. Use of electronic media
- c. Use of technology in courses
- d. Use of social software.

Using the Internet tool "SurveyMonkey" [3], a 45 questions survey was designed. The survey was then place online and students were told to answer it. For those students who did not have access to the Internet at home, a printed version of the online survey was distributed and students access the questions inside the classroom. Table II presents the contents of the survey and indicates the total of responses.

b. Teaching the Net Generation

The arrival of the new generation of students to higher education institutions during the last decade has brought with it an interesting discussion regarding the profile, learning interest and access to technologies that this new generation brings with it. Some argue that, since these students have spent less than 5,000 hours of their lives reading, but over 10,000 hours playing video games (not to mention 20,000 hours watching TV). Computer games,

email, the Internet, cell phones and instant messaging are integral parts of their lives [4], [5], [6].

As a result of this omnipresence of technology, these authors argue, today's students think and process information differently than their predecessors. Even more so, their entire beliefs and values are different from those in their previous generation and these differences usually go further and deeper than most educators realize. These are some of the reasons why today's students have received the title of being "digital natives" as Marc Prensky has named them. In coining this term, Prensky is making the analogy of natives to a homeland and in this case he refers to the "digital land", or those who have always known the internet. Others have called this new generation of students the "Net Gen" where net refers to networking or Internet use. Whether digital natives or net-geners, this generation was born when the computer was an important part of the dynamics of a home, where the Internet had become an integral part of daily activities.

On a more critical view of today's students, and challenging the vision of the so called "Net Gen", a group of researchers (located particularly in Canada and Germany) have challenged these assumptions arguing that hard data coming from these same students shows a different story and that the so-called digital natives are still keen in using traditional methods of learning and a small amount of technologies for learning [7], [8].

This interesting discussion was put to test by applying the survey to a group of students whose age ranged between 16-20 years old (44.2% of the total population), and 41-45 years old (3.5% of the total). An analysis of the survey findings is presented in the next section. A photo of a group of students involved in the survey is presented in Figure 1.

TABLE II
SURVEY CONTENT ANALYSIS

Total of questions	Topics	Total of responses	Online/ Printed
3	<i>Student's demographics</i>	665	O/P
5	Ownership of electronic devices	668	O/P
19	Use of Electronic Media	668	O/P
10	Use of Technology in Courses	668	O/P
6	Use of Social software	668	O/P
2	General comments	328	O



Figure 1. SAIT Students in the School of Transportation use their iPods as part of the "Mobile technology test" for Apprentices.

IV. ANALYSIS OF FINDINGS

Findings from the survey defined a clear picture of what students in the apprenticeship program are expecting when using technologies for learning. Technology ownership is obvious among most of them, but a preference for a limited amount of technologies for learning is also clearly stated. Analysis of the questions by topics is presented below.

a. Students' ownership of electronic devices

Respondents were asked to provide information on computer ownership. Results showed that 72.7% of the students have a desktop computer while 65.8 % own a Laptop (almost 40% of these computers have been in use for one year or less, while most of the Laptops owned fluctuated between 1-3 years).

Regarding the use of cell phones and other mobile technologies such as iPods, the number of students who have one of them is outstanding. 75% of the research population owns a cell phone while 60.9% has an iPod. Other mobile technologies mentioned in the survey were electronic devices to play games, which 58.5% of the surveyed students have one.

b. Students' use of Electronic Media

41.4% of the students in SAIT e-Readiness survey spend an average of 1-9 hours doing Internet activities for school, work or recreation. This statistic goes even further (to 51.3%) when asked how many of them spend 1-9 hours using the Internet. However, what it is interesting to note is that 9.7% of the sample spend 20 hours or more per week – in the range typically considered a half time job.

For students in the survey, technology is first about communication. 34.1% of them write, read and send an e-mail daily, while 46.3% send MSM every day.

A fourth of the surveyed students (26.8%) stated that they generally use IT before most people they know do. While almost half of them said they usually use new IT when most people they know do. These findings are interesting since they correlate with the fact that 46.3% of the students expressed that they prefer a “moderate” amount of IT in their courses, while a 1.26% of them stated they prefer taking courses that use technologies extensively. This finding is also consistent with the e-Readiness study performed at SAIT last academic year, even if new technologies have emerged and the overall digital environment has become increasingly dense. Especially, respondents emphasize that technology should not substitute face-to-face interaction with instructors.

c. Use of technology (IT) in courses

Most of the students in this sample (38 from 41) have never taken a course using a Learning Management System. This finding should be taken into serious

consideration when designing those apprentices course that will have an LMS component next academic year.

d. Use of social software

While almost half of the full time students use Social Networks daily at SAIT (Facebook, Twitter, etc.), spending 1-9 hours to stay in touch with friends (93.5%), only 21.9% of this sample does. Regarding students in the sample interest in Blogs or Wikis, findings were similar to the general SAIT population of students who stating they are not familiar with this type of sites (63% compared to 60.6% in the previous sample).

V. CONCLUSIONS AND FURTHER RESEARCH

How do higher education institutions' use of IT impact student success? How can be transfer technology skills acquired at colleges and universities to the workplace for these students? These are bottom-line concerns for both educators and administrators and has been an ongoing challenge for decades. This e-Readiness research provides a valuable opportunity to learn more about how students perceive the impact of IT on their academic course work. Focused on this variable, the e-Readiness Research designed questions about each of four important dimensions of success:

- Learning: “The use of IT in my courses improves my learning” (48.7% of the respondents agree)
- Time management: “IT help manage my course activities” (34% agree)
- Convenient of combining work and school: “IT makes doing my course activities more convenient” (34% agree)
- Lab preparedness: “The use of IT will allow me to review what I learn in the lab/workshop” (41.4% agree).

Further research needs to be done in order to test the results of this research to other areas of education and training. Furthermore, and as technologies become more familiar for apprentices in their workplace, apprentices' tutors, journeymen, and employers will need to be ready to attend these training expectations and to provide not only a proper time for updating skills, but also a rich technology environment where training is the centre. Moreover, further research is needed to determine the transferability of technology skills from colleges and universities to the workplace.

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AUTHOR

Martha Burkle is the CISCO Chair in e-Learning at SAIT Polytechnic, Calgary T2M0L4, Canada. (e-mail: Martha.Burkle@sait.ca).

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